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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,852	08/18/2003	Qinbai Fan	GTI-1542	4043
33058	7590	08/30/2007	EXAMINER	
MARK E. FEJER GAS TECHNOLOGY INSTITUTE 1700 SOUTH MOUNT PROSPECT ROAD DES PLAINES, IL 60018			CHU, HELEN OK	
			ART UNIT	PAPER NUMBER
			1745	
			MAIL DATE	
			08/30/2007	DELIVERY MODE
			PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s).
	10/642,852	FAN, QINBAI
	Examiner	Art Unit
	Helen O. Chu	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 02 July 2007.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-40 is/are pending in the application.  
 4a) Of the above claim(s) 15-39 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-14,40 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	_____ Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application 6) <input type="checkbox"/> Other: _____

### **DETAILED ACTION**

1. Applicant's Arguments/Remarks have been received on July 2, 2007.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

#### ***Continued Examination Under 37 CFR 1.114***

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 2, 2007 has been entered.

#### ***Claim Objections***

4. The objection on claim 1 is withdrawn.

#### ***Claim Rejections - 35 USC § 112***

The rejections under 35 U.S.C 112, first paragraph, on claims 1-14 are withdrawn because Applicant's amended the specification.

5. The rejections under 35 U.S.C 112, second paragraph, on claims 1-14 are maintained. The rejection is repeated below for convenience.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. **The claim(s) must be in one sentence form only.** Note the format of the claims in the patent(s) cited. The Applicants have more than one sentence in the claim(s).

6. Claims depending from claims rejected under 35 U.S.C 112, second paragraph are also rejected for the same.

***Claim Rejections - 35 USC § 103***

7. The rejections under 35 U.S.C 103(a) as unpatentable by Srinivas in view of Tripathy on claims 1-14 are maintained. The rejection is repeated below for convenience.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. <sup>and 40</sup> Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srinivas (US Publication 2004/0110051 A1) in view of Tripathy et al. (US Publication 2002/0183470 A1)

In regard to claims 1-11, 40, the Srinivas reference discloses a fuel cell with an anode catalyst layer comprising a proton conductive material made of sulfonic acid (Paragraph 22). The Srinivas reference discloses a grafted sulfonated polyaniline and a polypyrrole ionomer that is electrically conductive and dispersed throughout a carbon support in fuel cell catalysts (Paragraph 41 and Paragraph 30), however, the Srinivas reference does not disclose a material comprising lignin. The Tripathy et al. reference discloses the use of another form of polyaniline, or more specifically, polyaniline-lignin sulfonate complexes (Paragraph 25) which are used as catalyst disposed on electrically charged substrates (Abstract) in lightweight battery (Paragraph 3). The Tripathy reference further disclose these polyaniline-lignin sulfonate complexes are water soluble virtually eliminating the need for toxic reagents and solvents, and thus creating an environmentally friendly synthesis (Paragraph 14), therefore it would have been obvious to one of ordinary skill to place catalyst such as polyaniline-lignin sulfonate complexes disclosed by Tripathy into another electrochemical device such as the fuel cell; the fuel cell utilizes a sulfonated polyaniline catalyst layer as disclosed by Srinivas in order to create a light weight electrochemical cell without environmental hazards. It is well known in the art that a PEM fuel cell and battery are electrochemical devices have anodes, cathodes and a proton exchange membrane electrolyte. The PEM fuel cell and battery are therefore functional equivalence. The substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

In regards to claim 12, the Srinivas reference discloses a proton exchange membrane electrolyte with a thickness of 50-175  $\mu\text{m}$  (Paragraph 17).

In regards to claim 13, the Srinivas reference discloses a catalyst layer that comprises platinum from Johnson Matthey (Paragraph 28) with a combination of ruthenium (Paragraph 146) and has a loading  $0.15 \text{ mg/cm}^2$  (Paragraph 163).

In regards to claim 14, the Srinivas reference discloses the sulfonated group per monomer unit on the polymer ranges from 0.2- 2.9 (Paragraph 136).

#### ***Response to Arguments***

10. Applicant's arguments filed July 2, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

- A) "and no claim which is not in one sentence from has been cited by the Examiner." Applicant has ~~ever~~ carefully reviewed the rejected claims <sup>for</sup> ~~for~~ examples of problems stated by the Examiner, but has been unable to find any such examples.
- B) Nowhere does the Tripathy et al. publication teach the use of electrically conductive polymers in fuel cells.
- C) Nowhere does the Tripathy et al. publication teach or suggest the use of a lignosulfonate-Pani complexes as part of an anode catalyst layer which is both proton and electron conductive employed by a fuel cell as claimed by the Applicant.
- D) Applicant urges that fuel cells and batteries are not functional equivalents as asserted by the Examiner

In response to Applicant's arguments, please consider the following:

A) The rejection reads, "the claim(s) must be in one sentence form only."

Please take note that the claim or claims must be in one sentence form whereas the Applicants have more than one sentence in the claims.

B) The Srinivas reference discloses a grafted sulfonated polyaniline which is both electron and proton conductive. The Tripathy reference was used to demonstrate that sulfonated polyaniline can contain lignin in the compound and provided motivation fro use of the sulfonated polyaniline-lignin.

C) and D) The Srinivas reference discloses a grafted sulfonated polyaniline which is both electron and proton conductive in an anode catalyst of a fuel cell. The Tripathy reference was used to demonstrate that sulfonated polyaniline can contain lignin in the compound and provided motivation fro use of the sulfonated polyaniline-lignin. In response to applicant's arguments, the recitation fuel cell or direct methanol fuel cell has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 533 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). That is, the structures as claimed can be for a battery or a fuel cell and, as it is claimed, does not have much structural limitations to differentiate the two. Furthermore, while Applicants arguments address batteries and fuel cells are not functional equivalent, the Applicant's did not argue or provide evidence as to why

one of ordinary skill would not combine lignin in sulfonated polyaniline as taught by Tripathy to the grafted sulfonated polyaniline in an anode as taught by Srinivas.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
HOC  
TRACY DOVE  
PRIMARY EXAMINER  
8/07